which are new. These are equally distributed through the Jurassic and Cretaceous series; but there are none as old as our own *Actinometra Cheltonensis* from the Inferior Oolite of Gloucestershire, nor as young as various species from the Margate chalk. One of the Neocomian species belongs to the sub-genus *Ophiocrinus* of Semper, which is characterised by the presence of five undivided rays. There are only three recent species referable to this type, all of them inhabiting different portions of the Pacific Ocean. With the *Comatulæ* must be included two species of the curious genus *Thiollierícrinus*, recently mentioned in these columns (vol. xxiii. p. 377) as being a permanent larval form.

Prof. de Loriol's Monograph with its abundant illustrations forms an excellent supplement to the fourth volume of Quenstedt's wonderful "Petrefactenkunde Deutschlands," which deals with the *Encriniden*. Taken together, the two works give us a very complete account of the Mezozoic Crinoids of Central Europe. We understand that Prof. de Loriol is now working out the French Crinoids in the same way as he has treated the Swiss ones, and we hope that he will be enabled to complete this somewhat extensive task with an equally satisfactory result. This will render a similar work on the British Crinoids more than ever necessary, and we trust that it may be accomplished within a reasonable time.

The second book mentioned at the head of this article is the late Prof. Angelin's "Iconographia of the Silurian Crinoids of Sweden." It has been published as a posthumous work by the Swedish Academy, and is unquestionably the finest work on Crinoids that has ever appeared. It consists of twenty-nine beautifully-printed folio plates, which illustrate the marvellous wealth of Crinoids and Cystids in the Silurian rocks of Sweden. Some of the figures, such as those of *Crotalocrinus*, are excessively intricate, and they are all admirably clear and well-arranged. The lamented death of the eminent Swedish palæontologist has unfortunately prevented these figures from being as useful to his successors as they would have been, had he lived to describe them. They have been edited by two of his colleagues, Professors Lovén and Lindström, who have classified the genera and species according to the system which they found sketched out in Prof. Angelin's notes and manuscripts. Unfortunately, however, the classification is an entirely unnatural one, depending upon the number of basal plates in the calyx. Wachsmuth, the chief authority in America on the Palæocrinoids, has already pointed out that while it brings together very distinct types such as *Rhodocrinus* and *Poteriocrinus*, genera which are very intimately related, such as *Platycrinus* and *Dichocrinus*, are widely separated. Among the true Crinoids forty genera are figured, comprising 176 species, many of which are new. They are arranged into twenty-three families, but as these are not defined we are unable to learn the principles upon which they were established.

There are also figures of twenty-three Cystidean species, arranged into nine genera, including one new one, which fall into three sections, the *Apora*, *Gemellipora*, and *Rhombifera*. So far as can be judged from the species referred to each section, Angelin's classification is something more than an introduction of new names for the three divisions of the group which were sketched out by Müller. Neither of the three genera included in the *Apora*, Angelin, are ordinarily referred to the *Aporitidæ*; but *Echinosphærites aurantium* and *Caryocystites*, von Buch, were placed by Müller among the *Rhombiferi* or "Cystideen mit Porenrauten"; while the third genus, *Megacystites*, Hall, is ordinarily referred to the *Diploporitidæ*, which is a parallel group to the *Gemellipora*, Angelin.

As in the case of the true Crinoids, we are unable to learn the principle of Angelin's classification of the Cystidea. It is not likely therefore to be adopted, at any rate for the present. Possibly, however, it may stand the test of future discoveries better than the Müllerian system, though we do not think this contingency a very probable one.

In spite of the inconsistencies which we have mentioned, the "Iconographia" must be indispensable to every student of the Palæocrinoidea. A glance through its pages makes one long to see some really good illustrations of our British species. There are many specimens of the utmost beauty and novelty, both in our public museums and in private collections, which we hope will some day be properly described in a "Monograph of the Fossil Crinoids of the British Isles."

OUR BOOK SHELF

The Countries of the World. By Robert Brown. Vol. vi. (London: Cassell and Co.)

WE are surprised that, after so many volumes of this work have been devoted to the description of America and Asia, the whole of Europe and of Africa are disposed of in a single volume, a considerable part of it being devoted, moreover, to the Turkish Empire. This last is allotted 58 pages, whilst the whole of Europe is dealt with in 104 pages, and the whole of Africa in other 104 pages. Moreover, why should Turkey have the favour of receiving thrice as much space as Russia, which is actually dismissed in only eight pages, whilst France, Germany, Italy, and Spain have only four pages each. Does the Russian Empire, or Spain, with their variety of climate, of soil, and of population, afford less interest for the general reader than Asiatic Turkey, and Italy less than Senegambia or Liberia?

It is obvious that such a distribution of space must affect the entire value of the work. Certainly when reading Mr. Brown's book we have admired in many instances the talent with which he succeeds in condensing in to very few pages a good description of a country; but the book being intended to afford more interest to the general reader than a simple text-book of geography, the author has been compelled to enter into generalisations which cannot but give a false idea of the subject. Is it possible that the reader can have a true conception of the climate of France when he learns from Mr. R. Brown's book that "the climate is one of the finest in Europe—mild, equable, and healthy, in spite of the hot winds from Africa, which sometimes impinge on the southern districts, and the chilly 'mistral' which sweeps down from the Alps in the north"? Or, what an idea will be impressed upon his mind of Paris, when he learns only that "in Paris centres the most polished society of the world. From Paris are sent forth *the books, the bonnets, the pictures*, and possibly even the vices which are so largely aped by the rest of the civilised world. It is the city of pleasure. But, contrary to the general impression, the morals of Paris, if not high, are not superlatively low; for though these are depraved enough, they are infinitely superior in many respects to those of Vienna, Naples, Bucharest, and even Berlin, which is more cir-

©1881 Nature Publishing Group

cumspect and prudish." All this is quite right, but is it a description worthy of the great capital of the Continent? The same might be said of all the other countries touched by Mr. R. Brown in this volume. All that he says is quite correct, and we do not find such blunders as are too often found in geographical works. But the necessity of giving the reader a generalisation for the purpose of rendering the book more interesting often leads the author to make such generalisations as give to the reader a most untrue conception of the subject. We must regret that Mr. Brown has been compelled to condense his work in this way, and thus seriously diminish the value of what promised to be a useful and trustworthy compilation.

Phonetik. Zur vergleichenden Physiologie der Stimme und Sprache. By Dr. F. Techmer. (Leipzig: Engelmann, 1880.)

THE excellent work on the Physiology of Language published by Dr. Techmer under the above title forms the first volume of an Introduction to the Science of Language, the rest of which is hereafter to appear. We have little hesitation in saying that it is the best *résumé* that exists at present of what is known about the nature and formation of the sounds we utter.

Dr. Techmer has been well prepared for the task he has undertaken. In the first instance a student of natural science, he next devoted himself to the acquisition of modern European languages, then of languages so remote from ours as Chinese and Sanskrit, and finally to the study of comparative philology. Naturally, however, his earlier studies had inclined him rather to the investigation of the material of speech than to the antiquarian researches of the Indo-Germanists or the psychological inquiries of the school of Steinthal. He brought to the investigation a well-trained mind, an intimate acquaintance with physics, acoustics, and physiology, a wide range of reading, and keen observation. What he has to say, therefore, is well worthy of attention.

The ground he covers is so extensive that in order to bring his work within manageable compass he can do little more than indicate the chief facts, methods of investigation and results which have been arrived at by previous phoneticians, along with copious references and notes. These will enable the reader to follow each particular point into special detail, if he so wish. At the same time Dr. Techmer has not been content with being merely a passive reproducer of the opinions of others. He has carefully tested them wherever it has been possible, and made independent experiments of his own, the results of which he lays before us. Hence his judgments and criticisms are always of value, while the numerous and carefully-drawn illustrations and diagrams which accompany his work leave little to be desired.

He has done well in not forgetting the comparative method in his treatment of phonetics. Properly to understand the physiology of human speech it is necessary to compare our vocal organs with those of reptiles, mammals, and more especially birds. Jäger has already been struck by the curious relationship that seems to exist between the power of speech and walking on two feet, and has endeavoured to explain it, though not very successfully.

Perhaps the fact that is most brought home to our minds by a study of Dr. Techmer's book is the uncertainty and obscurity that still hang over a large part of phonetics. Experts still differ radically on some of the most fundamental details of the science. This is more especially the case with that side of the science which has to do with acoustics; on the physiological side it lends itself more readily to observation and experiment, and the physiological conditions requisite for the production of particular sounds are consequently much better known. Hence it is that the nature of the consonants is far more accurately determined than that of the vowels, and that it will be long before all the difficulties connected with the formation of the latter are satisfactorily removed. The best means of overcoming them will be a succession of works like this of Dr. Techmer's, at once clear, precise, and thorough.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

Medusæ

IN Mr. H. N. Moseley's "Notes by a Naturalist," on the *Challenger*, p. 404, a curious habit of Medusæ in the Island of Santa Cruz Major, is mentioned, viz. their lying on the tops of their umbrellas, its tentacles directed upwards. I think your readers may be interested to learn that I have frequently noticed Medusæ in a similar position in the West Indies. A few years ago I was quartered for some time at Port Royal, Jamaica, and in the channels between the mangroves I observed what I at first thought were Actineæ of large size on the muddy bottom, in about eight feet of water. They were very numerous. I stirred one up with the boat-hook, and was surprised to find it was a Medusa turned upside down. On being disturbed, it lazily contracted its umbrella in the usual manner and settled down again in the mud as before. The species was about a foot in diameter of umbrella, and dirty white in colour. I never saw them swimming in the mangrove creeks, though I was frequently out in a boat, and they were at all times common on the bottom, lying as described. Some time afterwards I saw what seemed to be the same species at St. George's Bay, a small island about ten miles from Belize, Honduras. It was lying in the same position on the mud amongst the mangroves, in about four feet of water. I poked several up with a stick, and they slowly swam for a short distance, and again settled down on their umbrellas. I believe it to be really the habit of the species to lie on its back, as it were, and it is interesting to find another kind in the east acting similarly. Mangrove swamps are extensive in the vicinity of Singapore, but I have not noticed any Medusæ here in that position, possibly because there is a considerable tide which leaves the mud bare at low water.

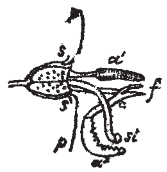
I think I have seen the habit noticed in some book, but cannot recollect where. H. ARCHER

Fort Canning, Singapore, June 28

Two Kinds of Stamens with Different Functions in the same Flower

THE following extract from a letter lately received from my brother Fritz Müller (of Blumenau, Prov. St. Catharina, Brazil) contains so new and curious an observation that it will probably interest the botanical readers of this journal.

"A species of Heeria (Melastomaceæ), which is not indigenous here, begins in my garden now to open its beautiful red flowers, remarkable for having two kinds of differently coloured anthers. The four petals spread in a perpendicular plane; the yellow anthers (a^1) of the four shorter filaments, closely pressed together, project from the middle of the flower; their bright yellow strikingly contrasts with the violet-shining light red of the corolla; the longer anthers (a^2) are red, like the filaments, and the very long connective (*c*), which is lengthened beyond the point of insertion



Flower of Heeria spec., longitudinally dissected. *s*, sepals; *p*, petals; a^1, one of the conspicuous yellow anthers which attract the insects; a^2 one of the inconspicuous red anthers, which powder the insects with pollen; *c*, connective of this anther; *f*, fork of this connective; *st*, stigma.

©1881 Nature Publishing Group